

UTILITY PATENT APPLICATION TRANSMITTAL

(Large Entity)

(Only for new nonprovisional applications under 37 CFR 1.53(b))

Docket No.

JEL 31058

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TO THE ASSISTANT COMMISSIONER FOR PATENTS

Box Patent Application

Washington, D.C. 20231

Submitted herewith for filing under 35 U.S.C. 111(a) and 37 C.F.R. 1.53(b) is a new utility patent application for an invention entitled:

PORTABLE TELEPHONE APPARATUS AND AUDIO APPARATUS

and invented by:

Kenji SAKANASHI

If a **CONTINUATION APPLICATION**, check appropriate box and supply the requisite information:

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Enclosed are:

Application Elements

1. ☒ Filing fee as calculated and transmitted as described below
2. ☒ Specification having 28 pages and including the following:
 - a. ☒ Descriptive Title of the Invention
 - b. ☐ Cross References to Related Applications (if applicable)
 - c. ☐ Statement Regarding Federally-sponsored Research/Development (if applicable)
 - d. ☐ Reference to Microfiche Appendix (if applicable)
 - e. ☒ Background of the Invention
 - f. ☒ Brief Summary of the Invention
 - g. ☒ Brief Description of the Drawings (if drawings filed)
 - h. ☒ Detailed Description
 - i. ☒ Claim(s) as Classified Below
 - j. ☒ Abstract of the Disclosure

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3. ☒ Drawing(s) *(when necessary as prescribed by 35 USC 113)*
- a. ☒ Formal Number of Sheets 8
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4. ☒ Oath or Declaration
- a. ☒ Newly executed *(original or copy)* ☐ Unexecuted
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- c. ☒ With Power of Attorney ☐ Without Power of Attorney
- d. ☐ DELETION OF INVENTOR(S)
Signed statement attached deleting inventor(s) named in the prior application,
see 37 C.F.R. 1.63(d)(2) and 1.33(b).
5. ☐ Incorporation By Reference *(usable if Box 4b is checked)*
The entire disclosure of the prior application, from which a copy of the oath or declaration is supplied under Box 4b, is considered as being part of the disclosure of the accompanying application and is hereby incorporated by reference therein.
6. ☐ Computer Program in Microfiche *(Appendix)*
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Accompanying Application Parts

8. ☒ Assignment Papers *(cover sheet & document(s))*
9. ☐ 37 CFR 3.73(B) Statement *(when there is an assignee)*
10. ☐ English Translation Document *(if applicable)*
11. ☒ Information Disclosure Statement/PTO-1449 ☒ Copies of IDS Citations
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Accompanying Application Parts (Continued)

15. ☒ Certified Copy of Priority Document(s) (if foreign priority is claimed)

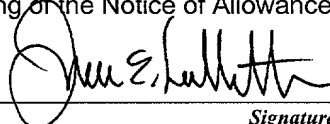
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Multiple Dependent Claims (check if applicable) <input type="checkbox"/>					\$0.00
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PORTABLE TELEPHONE APPARATUS AND AUDIO APPARATUS

FIELD OF THE INVENTION

The present invention relates to a portable telephone apparatus (including a PHS and a cordless telephone) capable of reproducing a music, and an audio
5 apparatus.

BRIEF DESCRIPTION OF THE DRAWINGS

Fig. 1 is a block diagram of a portable telephone apparatus and peripheral devices according to a first embodiment of the invention.

10 Fig. 2 is a block diagram of a portable telephone apparatus and peripheral devices according to a second embodiment of the invention.

Fig. 3 is a block diagram of a portable telephone apparatus and peripheral devices according
15 to a third embodiment of the invention.

Fig. 4 is a block diagram of a portable telephone apparatus and peripheral devices according to a fourth embodiment of the invention.

Fig. 5 is a block diagram of a portable
20 telephone apparatus and peripheral devices according to a fifth embodiment of the invention.

Fig. 6 is a block diagram of a portable telephone apparatus and peripheral devices according to a sixth embodiment of the invention.

Fig. 7 is a block diagram of a portable
5 telephone apparatus and peripheral devices according to a seventh embodiment of the invention.

Fig. 8 is a block diagram of a portable telephone apparatus and peripheral devices according to the prior art.

10 A block diagram of a portable telephone apparatus and peripheral devices according to the prior art is shown in Fig. 8.

BACKGROUND OF THE INVENTION

In Fig. 8, reference numeral 1 designates a
15 portable telephone apparatus (child unit), numeral 2 an antenna for holding communication with a base station (or a parent unit), numeral 3 telephone control means for controlling the modulation/demodulation and the transmission/reception of a voice signal, numeral
20 4 a microphone, numeral 5 a speaker (or a headphone/earphone), numeral 6 operating means including keys and a liquid crystal display unit operated by the user, numeral 7 a battery, numeral 8 power supply means for supplying power to the portable
25 telephone apparatus 1 from a charger 9, numeral 9 the charger for charging the portable telephone apparatus 1, and numeral 10 a power supply unit for generating

the DC power of the voltage required for charging the portable telephone.

The operation of the conventional portable telephone apparatus will be described. When the portable telephone apparatus 1 is used, the user first
5 turns the telephone off-hook by the operating means 6, and dials a desired number. This information is modulated by the telephone control means 3, and transmitted from the antenna 2 by radio to the base
10 station (or the parent unit), and when it is connected to the called party, the apparatus enters a busy mode. A voice of the user in busy mode is input from the microphone 4, modulated by the telephone control means 3 and transmitted to the base station by radio.
15 Conversely, a voice of the other party is inputted to the antenna 2 by radio from the base station, demodulated by the telephone control means 3 and outputted from the speaker 5. Upon termination of the busy mode, the apparatus is turned on-hook state by the
20 operating means 6 thereby to disconnect the channel.

Also, in the case where the battery 7 is so consumed that it requires charging in busy mode, the charger 9 sets the portable telephone apparatus 1, and charges the battery 7 through the power supply means
25 8 from the power supply unit 10. The power supply means 8 may be an electrode-contacting type, but the contactless type using an induction coil is in current mainstay.

SUMMARY OF THE INVENTION

The portable telephone apparatus having the configuration described above, however, has only the basic function of transmitting/receiving the voice, but no function of reproducing the music. The user, who wants to use both a conventional portable telephone and a portable audio apparatus at the same time, therefore, is required to carry both of them inconveniently. Also, there has been no means for downloading music data to the portable telephone apparatus.

An object of the present invention is to solve the above-mentioned problems and to provide a portable telephone apparatus in which both the conversation can be held and the music can be heard.

In order to achieve the object, a portable telephone apparatus according to this invention comprises storage means for storing compressed music data and data restoration means for reading and expanding the data stored in the storage means and reproducing it as a music signal. Both the function as a telephone and the function of reproducing the music can be realized with a single device. The user can enjoy the music by carrying a single portable telephone apparatus.

According to claim 1 of the invention, there is provided a portable telephone apparatus comprising:

an antenna for holding communication with a
base station or a parent unit;

voice input means such as a microphone;

voice output means such as a speaker or a
5 headphone;

operating means including keys and a display
unit used by the user operating the apparatus;

telephone control means for modulating the
voice signal from the voice input means and outputting
10 the modulated signal to the antenna on one hand and
demodulating the radio signal received by way of the
antenna, extracting the voice signal and outputting the
voice signal to the voice output means on the other
hand;

15 a chargeable battery for supplying power to
the whole apparatus;

storage means for storing the compressed
music data; and

data restoration means for reading and
20 expanding the data stored in the storage means,
reproducing the data as a music signal and outputting
the music signal to the voice output means;

wherein the music supplied from another audio
apparatus are compressed and stored in the storage
25 means in the portable telephone apparatus, and the user
reads the data stored in the storage means through the
operating means, which data are expanded by the data

restoration means and can be reproduced through the voice output means such as the speaker or the headphone.

According to claim 2 of the invention, there is provided a portable telephone apparatus comprising:

5 an antenna for holding communication with a base station or a parent unit;

 voice input means such as a microphone;

 voice output means such as a speaker or a headphone;

10 operating means including keys and a display unit used by the user operating the apparatus;

 telephone control means for modulating the voice signal from the voice input means and outputting the modulated signal to the antenna on one hand and
15 demodulating the radio signal received through the antenna, extracting the voice signal and outputting the voice signal on the other hand;

 a chargeable battery for supplying power to the whole apparatus;

20 storage means for storing the compressed music data;

 data restoration means for reading and expanding the data stored in the storage means and reproducing the data as a music signal; and

25 switching means for selecting the voice signal demodulated by the telephone control means or the music signal reproduced by the data restoration

means and outputting the selected signal to the voice output means;

wherein the operation of the switching means for switching and selecting the signal is performed
5 through the operating means;

wherein the compressed music data are downloaded to the storage means in the portable telephone apparatus, and the user reads the data from the storage means through the operating means, which
10 data are expanded by the data restoration means and can be reproduced as a music signal. Also, in the case where the switching means selects the music signal, the reproduced music is produced from the voice output means. Otherwise, a voice signal of the telephone set
15 from the telephone control means is selected. The switching means may be operated by the user manipulating the keys, or the telephone voice signal can be automatically selected in off-hook state, judging from the busy mode of the telephone set.

20 According to claim 4 of the invention, there is provided a portable telephone apparatus comprising:

an antenna for holding communication with a base station or a parent unit;

voice input means such as a microphone;

25 voice output means such as a speaker or a headphone;

operating means including keys and a display unit manipulated by the user operating the apparatus;

telephone control means for modulating the voice signal from the voice input means and outputting the modulated signal to the antenna on one hand and demodulating the radio signal received through the antenna, extracting the voice signal and outputting the voice signal on the other hand;

a chargeable battery for supplying power to the whole apparatus;

storage means for storing the compressed music data;

data restoration means for reading and expanding the data stored in the storage means and reproducing the data as a music signal;

first mixing means for mixing the voice signal from the voice input means with the music signal reproduced by the data restoration means and outputting a mixture signal to the telephone control means; and

second mixing means for mixing the voice signal demodulated by the telephone control means with the music signal reproduced by the data restoration means and outputting a mixture signal to the voice output means;

wherein the mixing ratio in the mixing means is variable by the operation of the operating means;

wherein the data stored in the storage means is read and reproduced by the voice output means, the voice signal received by the antenna and demodulated by the telephone control means can be mixed with the

music signal and outputted from the voice output means,
and the voice signal from the voice input means can be
mixed with the music signal and outputted to the radio
channel, so that the music can be enjoyed even when the
5 line is busy.

According to claim 5 of the invention, there
is provided a portable telephone apparatus comprising:

an antenna for holding communication with a
base station or a parent unit;

10 voice input means such as a microphone;
voice output means such as a speaker or a
headphone;

operating means including keys and a display
unit manipulated by the user operating the apparatus;

15 telephone control means for modulating the
voice signal from the voice input means and outputting
the modulated signal to the antenna on one hand and
demodulating the radio signal received through the
antenna, extracting the voice signal and outputting the
20 voice signal on the other hand;

a chargeable battery for supplying power to
the whole apparatus;

storage means for storing the compressed
music data;

25 data restoration means for reading and
expanding the data stored in the storage means and
reproducing the data as a music signal;

first mixing means for mixing the voice signal from the voice input means with the music signal reproduced by the data restoration means and outputting a mixture signal to the telephone control means;

5 second mixing means for mixing the voice signal demodulated by the telephone control means with the music signal reproduced by the data restoration means and outputting a mixture signal to the voice output means; and

10 means for changing the mixing ratio in the mixing means according to the busy mode of the telephone set;

 wherein the data stored in the storage means is read and reproduced by the voice output means, and
15 when the telephone set is off-hook, the telephone voice signal can be automatically selected.

 According to claim 6 of the invention, there is provided a portable telephone apparatus comprising:

 an antenna for holding communication with a
20 base station or a parent unit;

 voice input means such as a microphone;

 voice output means such as a speaker or a
headphone;

 operating means including keys and a display
25 unit manipulated by the user operating the apparatus;

 telephone control means for modulating the voice signal from the voice input means and outputting the modulated signal to the antenna on one hand and

demodulating the radio signal received through the antenna, extracting the voice signal and outputting the voice signal on the other hand;

a chargeable battery for supplying power to
5 the whole apparatus;

storage means for storing the compressed music data;

data restoration means for reading and expanding the data stored in the storage means and
10 reproducing the data as a music signal;

first mixing means for mixing the voice signal from the voice input means with the music signal reproduced by the data restoration means and outputting a mixture signal to the telephone control means;

15 second mixing means for mixing the voice signal demodulated by the telephone control means with the music signal reproduced by the data restoration means and outputting a mixture signal to the voice output means; and

20 means for increasing the mixing ratio of the music signal in the first mixing means in the case where the busy mode is suspended by the operating means;

wherein in the case where the busy mode is suspended, the music can be furnished as a suspension
25 message to the other party.

According to claim 9 of the invention, there is provided a portable telephone apparatus comprising:

an antenna for holding communication with a
base station or a parent unit;

voice input means such as a microphone;

voice output means such as a speaker or a
5 headphone;

operating means including keys and a display
unit manipulated by the user operating the apparatus;

telephone control means for modulating the
voice signal from the voice input means and outputting
10 the modulated signal to the antenna on one hand and
demodulating the radio signal received through the
antenna, extracting the voice signal and outputting the
voice signal to the voice output means on the other
hand;

15 a chargeable battery for supplying power to
the whole apparatus;

storage means for storing the compressed
music data;

data restoration means for reading and
20 expanding the data stored in the storage means,
reproducing the data as a music signal and outputting
the music signal to the voice output means; and

wire, radio or optical communication means
for downloading the compressed music data to the
25 storage means from an external source;

wherein the music selected by the user from
another audio apparatus can be compressed, and the
compressed music data is downloaded to the storage

means in the portable telephone apparatus by the communication means, so that the compressed music data can be stored in the storage means of the portable telephone apparatus and reproduced by the voice output
5 means including the speaker or the headphone.

According to claim 13 of the invention, there is provided a portable telephone apparatus comprising:
an antenna for holding communication with a base station or a parent unit;

10 voice input means such as a microphone;
voice output means such as a speaker or a headphone;

operating means including keys and a display unit manipulated by the user operating the apparatus;
15 telephone control means for modulating the voice signal from the voice input means and outputting the modulated signal to the antenna on one hand and demodulating the radio signal received through the antenna, extracting the voice signal and outputting the
20 voice signal to the voice output means on the other hand;

a chargeable battery for supplying power to the whole apparatus;

storage means for storing the compressed
25 music data;

data restoration means for reading and expanding the data stored in the storage means, reproducing the data as a music signal and outputting

the music signal to the voice output means;

wherein not only the telephone voice but the music data contained in the radio wave arriving from the base station or the parent unit is demodulated by the telephone control means and stored in the storage means, thereby making it possible to download the music data sent from another audio apparatus through the telephone line, the base station or the parent unit to the storage means in the portable telephone apparatus.

10 According to claim 14 of the invention, there is provided an audio apparatus comprising:

data compression means for compressing the music data into a format expandable by the data restoration means through the conversion process corresponding to the recording scheme of at least one of a plurality of audio media including CD, MD and the cassette tape; and

communication means capable of downloading the compressed music data to the portable telephone apparatus;

wherein the conversion process corresponding to the recording scheme of each medium makes it possible to connect the audio apparatus to the portable telephone apparatus and download the music data to the portable telephone apparatus by the communication means, and therefore the user can enjoy a high quality music by use of the portable telephone apparatus.

According to claim 15 of the invention, there is provided an audio apparatus comprising:

data compression means for compressing a music data into a format expandable by the data
5 restoration means through the conversion process corresponding to the recording scheme of at least one of a plurality of audio media including CD, MD and the cassette tape;

removable storage means; and
10 means for writing the compressed music data into the removable storage means;

wherein the removable storage means can be removed from the audio apparatus and mounted on the portable telephone apparatus so that the user can enjoy
15 the high quality music by use of the portable telephone apparatus.

According to claim 16 of the invention, there is provided an audio apparatus comprising:

data compression means for compressing a
20 music data into a format expandable by the data restoration means through the conversion process corresponding to the recording scheme of at least one of a plurality of audio media including CD, MD and the cassette tape; and

25 a power supply unit for charging the battery;
wherein the music data can be downloaded while at the same time the battery is charged. Since the audio apparatus is integrated with the charger and the

compressed music data can be downloaded while the portable telephone apparatus is combined with the audio apparatus for the purpose of charging, the operation time can be shortened.

5 DESCRIPTION OF THE EMBODIMENTS

(Embodiment 1)

A portable telephone apparatus according to an embodiment of the invention will be described with reference to the drawings. Fig. 1 is a block diagram
10 showing a portable telephone apparatus and peripheral devices according to a first embodiment of the invention. In Fig. 1, numerals 1 to 10 designate components parts having the same function as the corresponding parts of the conventional apparatus,
15 which with the same reference numerals attached thereto, will not be described. Numeral 11 designates a memory such as a flush ROM constituting storage means for storing the compressed music data, numeral 12 data restoration means for reading and expanding the music
20 data stored in the storage means, converting them into an analog signal, and reproducing them as a music signal, numeral 13 switching means for switching between the voice signal demodulated by the telephone control means 3 and the music signal reproduced by the data
25 restoration means 12 in response to a switching signal from music control means 14 and outputting the selected signal to the speaker 5, numeral 14 the music control

means for controlling the storage means 11 and the data restoration means 12 by the control signal from the operating means 6 or the telephone control means 14, numeral 15 communication means for downloading the compressed music data from an external source, numeral 16 an audio apparatus having the function of reproducing the music source and compressing it as data, numeral 17 a player unit for reproducing various media such as CD, MD or cassette tape, processing the signal in a way corresponding to each type of medium, and outputting the signal in a predetermined digital format, and numeral 18 data compression means for compressing the output of the player into a format that can be restored by the data restoration means 12.

15 An operation of the portable telephone apparatus having the aforementioned configuration will be described.

 The operation of the telephone set using the portable telephone apparatus 1 is substantially the same as the operation in the prior art. The exception is that the switching means 13 is inserted before the speaker 5 for selecting the voice signal or the music signal according to whether the telephone set is in off-hook or not and outputs the resulting signal to the speaker 5. Specifically, in response to the control signal from the operating means 6 and the telephone control means 3, the music control means 14 determines whether the telephone set is in off-hook or not and

notifies the result of determination to the switching means 13. In the case where the telephone set is in off-hook, the switching means 13 selects the voice signal, and otherwise, selects the music signal from the data restoration means 12. Now, the music reproducing operation by the portable telephone apparatus 1 according to this embodiment will be described.

First, the compressed music data input through the downloading communication means 15 are accumulated in the storage means 11. The user selects a desired musical number through the operating means 6, and the result is notified to the music control means 14. The music control means 14 causes outputs the storage means 11 to output the data of the corresponding portion, and expanding and converting it into an analog signal in the data restoration means 12, reproduces it as a music signal. In the process, the switching means 13 selects the music signal and the music begins to pour out from the speaker 5. In the case where the earphone of headphone type which begins to be widely used is employed, the user can enjoy the music more. Even in the case where the speaker 5 is monaural, the communication means 15, the storage means 11 and the data restoration means 12 are desirably configured as stereophonic means in case of hearing the music through the earphone of headphone type.

In the case where the need arises of sending a call or a call arrives during the reproduction of the music, the user turns the phone into off-hook by the operating means 6. As a result, the switching means 5 13 selects the voice signal as described above, and thus the speech can be started. Upon complete speech and when the telephone set turns on-hook, the switching means 13 selects the music signal again so that the music can be reproduced from the speaker 5.

10 During this interruption due to the busy mode, the following choices are available for reproducing the music.

 (1) While the telephone set is in off-hook, the storage means 11 and the data restoration means 12 15 are reset to an initial state, and when the telephone set turns on-hook, a number is selected anew.

 (2) As soon as the telephone set turns off-hook, the operation of the storage means 11 and the data restoration means 12 are suspended, while when the 20 telephone set turns on-hook, the operation is continued.

 (3) Also during the off-hook state, the operation of the storage means 11 and the data restoration means 12 is continued, but the switching 25 means 13 is switched.

Each of the choices has an advantage and disadvantage, and any one of them may be used.

Desirably, the apparatus is so configured that the user can set his choice.

The storage means 11 is configured to read/write the telephone data such as the abbreviated dial and the data such as memo data produced by the operating means 6 as well as the music data.

The operation of compressing and downloading the music data according to this embodiment will be described.

10 The audio apparatus 16 is assumed to include a player unit 17 corresponding to at least one of a plurality of media including the CD, MD, cassette tape and the DAT. The player unit 17 converts the output of any type of the medium into a predetermined digital
15 format such as WAVE which can be compressed by the data compression means 18. For this purpose, the digitizing operation such as sampling is performed for the analog medium including the cassette tape. For other digital media, too, the output thereof is
20 converted into the predetermined digital format described above by manipulating the format of the music data recorded.

In the data compression means 18, the input music data is compressed and the data amount reduced
25 in order to reduce the time required for downloading or the capacity of the storage means 11.

Any method of compressing the music data can be employed as far as it matches the data restoration

means 12.

MP3 (MPEG1 Audio Layer 3), for example, is desirable as the data amount can be compressed to about one tenth with the sound quality maintained at a level
5 equivalent to CD. Other appropriate compression methods can also be selected in relation to the capacity of the storage means 11. With the increase in the capacity and reduction in a price of the storage means 11, a method may become available in which the data is
10 downloaded directly to the storage means 11 without any compression or expansion in the data restoration means 12.

The music data compressed in the manner described above is downloaded to the storage means 11
15 in the portable telephone apparatus 1 by the communication means 15. The communication means 15 may be of any type including wired, radio or optical, as far as it has an interface matching the portable telephone apparatus 1 such as RS232 or IrDA.

20 The charging operation according to this embodiment is similar to that in the prior art.

(Embodiment 2)

Fig. 2 is a block diagram showing a portable telephone apparatus and peripheral devices according
25 to a second embodiment of the invention. In Fig. 2, the points different from the first embodiment will be described.

In Fig. 2, the audio apparatus 16 is integrated with the charger 9 shown in Fig. 1. Specifically, with the portable telephone apparatus 1 set in the charger 9, the downloading communication means 15 is connected. This configuration is more functional than that of Fig. 1 as the peripheral devices required for the charging and the downloading of the music data can be grouped into a single set. Also, when arrangement is made to start the charge operation as soon as the downloading is started, the charging time can be reduced while at the same time compensating for the power consumption of the portable telephone apparatus due to the downloading operation.

(Embodiment 3)

Fig. 3 is a block diagram showing a portable telephone apparatus and peripheral devices according to a third embodiment of the invention. The different points in Fig. 3 from the first embodiment will be described.

In Fig. 3, the method of downloading the music data is different from that of Fig. 1. Specifically, assume that the music data arrives by radio from the base station and is inputted from the antenna. The signal inputted to the antenna 2 is demodulated by the telephone control means 3, and extracted as digital data and accumulated in the storage means 11 through the music control means 14. The user registers a

request for a number beforehand in the base station through the operating means 6. The radio wave arriving from the base station carries both the voice signal and the music signal.

5 (Embodiment 4)

Fig. 4 is a block diagram showing a portable telephone apparatus and peripheral devices according to a fourth embodiment of the invention. The difference of the configuration shown in Fig. 4 from
10 the first embodiment will be described below.

In Fig. 4, the switching means 13 of Fig. 1 is replaced by mixing means 19 arranged at two points. The mixing means 19a mixes the voice picked up by the microphone 4 with the music signal, and outputs it to
15 the telephone control means. The mixing means 19b, on the other hand, mixes the voice of the other party outputted from the telephone control means 3 with the music signal and outputs it to the speaker. The mixing ratio is variable according to the control signal from
20 the music control means 14, whereby the two mixing means perform the same function as the switching means of the first embodiment.

The operation of the mixing means 19a permits a voice of the user to be carried with the music to the
25 other party. Also, the operation of the mixing means 19b makes it possible to mix the voice of the other party outputted from the telephone control means 3 with the

music and to output it to the speaker. Thus, the conversation with a background music can be enjoyed.

Also, when the speech, i.e. the busy mode is suspended, the music can be furnished to the other party
5 as a waiting message by controlling the mixing means 19a.

(Embodiment 5)

Fig. 5 is a block diagram showing a portable telephone apparatus and peripheral devices according
10 to a fifth embodiment of the invention. The points different in Fig. 5 from the first embodiment will be described.

In Fig. 5, the communication means 15 is capable of bidirectional communication, and the
15 information inputted by the operating means 6 can be transmitted to the audio apparatus 16 unlike in Fig. 1. As a result, the retransmission is facilitated in case of communication error which may occur during the downloading operation. Also, the selection of a
20 number to be downloaded and a setting of timing of starting the downloading are also made possible by the operating means 6 of the portable telephone apparatus 1.

(Embodiment 6)

25 Fig. 6 is a block diagram showing a portable telephone apparatus and peripheral devices according

to a sixth embodiment of the invention. The points in Fig. 6 different from the first embodiment will be described below.

In Fig 6, the storage means 11 is assumed to
5 be a device in the form of removable card such as a smart card. The built-in data can be inputted/outputted through the card interface 20. In this case, the music data read from the storage means 11 by the card interface 20a is outputted to the data restoration
10 means 12.

In this case, the music data is written in the storage means 11 by purchasing a prewritten medium and exchanging it to permit the user to enjoy various numbers, or as shown in Fig. 6, the audio apparatus 16
15 is equipped with the card interface 20b for the user to write by himself.

(Embodiment 7)

Fig. 7 is a block diagram showing a portable telephone apparatus and peripheral devices according
20 to a seventh embodiment. The different points of Fig. 7 from the first embodiment will be described below.

In Fig. 7, numeral 21 designates a headphone jack, through which the music signal reproduced by the data restoration means 12 can be heard through the
25 headphone. The voice signal outputted from the telephone control means 3, on the other hand, is

directly outputted from the speaker 5. This double system of the voice output means can realize a similar function to the first embodiment with a simple circuit configuration. At the same time, the sound quality can be improved by separating the circuits. Also, in the case where the telephone set is in off-hook, judging from the key operation of the operating means 6 or the busy mode of the telephone set, the music control means 14 may suspend the operation of the data restoration means 12 and mutes the music signal.

The aforementioned configuration provides a portable telephone apparatus capable of music reproduction.

With the portable telephone apparatus according to this invention, unlike the conventional portable telephone apparatus, the user wanting to use both the phone and music functions is not required to carry both the portable telephone apparatus and the portable audio apparatus at the same time, but a single portable telephone apparatus can realize both the phone function and the music reproduction function also very conveniently.

Also, in view of the fact that the audio player having the function of compressing the music data for various media and downloading it to the portable telephone apparatus is integrated with the charger, the peripheral devices required for charging the battery and downloading the music data can be integrated into

a single device for an improved functionality. As a result, the time for charging is saved thereby to compensate for the power consumption of the portable telephone apparatus due to the downloading operation.

5 Also, the configuration is such that the music data can be downloaded over the radio wave from the base station, and therefore the audio apparatus for compression and downloading is eliminated.

10 Further, since the voice signal is mixed with the music signal and outputted from the speaker or transmitted to the other party of speech, the conversation with a background music can be enjoyed or the music can be furnished to the other party as a waiting message while the busy state is suspended.

15 Furthermore, the communication means for compression and downloading between the audio apparatus and the portable telephone apparatus is capable of bidirectional communication, and therefore the retransmission is facilitated in case of a
20 communication error which may occur during the download operation. Also, the selection of a number to be downloaded or the timing of starting downloading can be set by the operation of the portable telephone apparatus.

25 In addition, since the storage means is removable, the block for downloading is eliminated, and the user can enjoy various numbers simply by replacing the storage means.

Further, the voice signal is outputted from the speaker and the music signal is outputted from the headphone jack, and therefore a similar function can be realized with a simple circuit configuration. Also,
5 the sound quality is improved by separating the circuits.

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CLAIMS:

1. A portable telephone apparatus comprising:
an antenna for holding communication with a
base station or a parent unit;
voice input means including a microphone;
voice output means including a speaker or a
headphone;
operating means including keys and a display
unit used by a user for operating the apparatus;
telephone control means for modulating a
voice signal from the voice input means and outputting
the modulated signal to the antenna and demodulating
a radio signal received through the antenna, extracting
and outputting the voice signal to the voice output
means;
a chargeable battery for supplying power to
the apparatus;
storage means for storing a compressed music
data; and
data restoration means for reading and
expanding the data stored in the storage means,
reproducing the data as a music signal and outputting
the music signal to the voice output means.
2. A portable telephone apparatus comprising:
an antenna for holding communication with a
base station or a parent unit;
voice input means including a microphone;

3. A portable telephone apparatus comprising:
an antenna for holding communication with a
base station or a parent unit;

voice input means including a microphone;
voice output means including a speaker or a
headphone;

operating means including keys and a display
unit manipulated by a user operating the apparatus;

telephone control means for modulating a
voice signal from the voice input means and outputting
the modulated signal to the antenna and demodulating
a radio signal received through the antenna, extracting
and outputting the voice signal;

a chargeable battery for supplying power to
the apparatus;

storage means for storing a compressed music
data;

data restoration means for reading and
expanding the data stored in the storage means and
reproducing the data as a music signal; and

switching means for selecting the voice
signal demodulated by the telephone control means or
the music signal reproduced by the data restoration
means and outputting the selected signal to the voice
output means;

wherein the signal is switched by the
switching means according to a busy mode of the
telephone apparatus.

4. A portable telephone apparatus comprising:
an antenna for holding communication with a

base station or a parent unit;

voice input means including a microphone;

voice output means including as a speaker or
a headphone;

operating means including keys and a display
unit manipulated by a user operating the apparatus;

telephone control means for modulating a
voice signal from the voice input means and outputting
the modulated signal to the antenna and demodulating
a radio signal received through the antenna, extracting
and outputting the voice signal;

a chargeable battery for supplying power to
the apparatus;

storage means for storing a compressed music
data;

data restoration means for reading and
expanding the data stored in the storage means and
reproducing the data as a music signal;

first mixing means for mixing the voice signal
from the voice input means with the music signal
reproduced by the data restoration means and outputting
a mixture signal to the telephone control means; and

second mixing means for mixing the voice
signal demodulated by the telephone control means with
the music signal reproduced by the data restoration
means and outputting a mixture signal to the voice
output means;

wherein a mixing ratio in the mixing means is changed by an operation of the operating means.

5. A portable telephone apparatus comprising:
an antenna for holding communication with a base station or a parent unit;

voice input means including a microphone;
voice output means including a speaker or a headphone;

operating means including keys and a display unit manipulated by a user for operating the apparatus;

telephone control means for modulating a voice signal from the voice input means and outputting the modulated signal to the antenna and demodulating a radio signal received through the antenna, extracting and outputting the voice signal;

a chargeable battery for supplying power to the apparatus;

storage means for storing a compressed music data;

data restoration means for reading and expanding the data stored in the storage means and reproducing the data as a music signal;

first mixing means for mixing the voice signal from the voice input means with the music signal reproduced by the data restoration means and outputting a mixture signal to the telephone control means;

second mixing means for mixing the voice signal demodulated by the telephone control means with

the music signal reproduced by the data restoration means and outputting a mixture signal to the voice output means; and

means for changing a mixing ratio in the mixing means according to a busy mode of the telephone apparatus.

6. A portable telephone apparatus comprising:
an antenna for holding communication with a base station or a parent unit;

voice input means including a microphone;

voice output means including a speaker or a headphone;

operating means including keys and a display unit manipulated by a user operating the apparatus;

telephone control means for modulating a voice signal from the voice input means and outputting the modulated signal to the antenna and demodulating a radio signal received through the antenna, extracting and outputting the voice signal;

a chargeable battery for supplying power to the apparatus;

storage means for storing a compressed music data;

data restoration means for reading and expanding the data stored in the storage means and reproducing the data as a music signal;

first mixing means for mixing the voice signal from the voice input means with the music signal

reproduced by the data restoration means and outputting a mixture signal to the telephone control means;

second mixing means for mixing the voice signal demodulated by the telephone control means with the music signal reproduced by the data restoration means and outputting a mixture signal to the voice output means; and

means for increasing a mixing ratio of the music signal in the first mixing means when a busy mode is suspended by the operating means.

7. A portable telephone apparatus comprising:
an antenna for holding communication with a base station or a parent unit;

voice input means including a microphone;

operating means including keys and a display unit manipulated by a user operating the apparatus;

telephone control means for modulating a voice signal from the voice input means and outputting the modulated signal to the antenna and demodulating a radio signal received through the antenna, extracting and outputting the voice signal;

a chargeable battery for supplying power to the apparatus;

storage means for storing a compressed music data;

data restoration means for reading and expanding the data stored in the storage means and reproducing the data as a music signal;

first voice output means for outputting as a sound the voice signal demodulated by the telephone control means; and

second voice output means for outputting as a sound the music signal reproduced by said data restoration means;

wherein a volume of said second voice output means is adjusted by an operation of said operating means.

8. A portable telephone apparatus comprising:
an antenna for holding communication with a base station or a parent unit;

voice input means including a microphone;

operating means including keys and a display unit manipulated by a user operating the apparatus;

telephone control means for modulating a voice signal from the voice input means and outputting the modulated signal to the antenna and demodulating a radio signal received through the antenna, extracting and outputting the voice signal;

a chargeable battery for supplying power to the apparatus;

storage means for storing a compressed music data;

data restoration means for reading and expanding the data stored in the storage means and reproducing the data as a music signal;

first voice output means for outputting as a sound the voice signal demodulated by the telephone control means; and

second voice output means for outputting as a sound the music signal reproduced by said data restoration means;

wherein a sound volume of said second voice output means is adjusted according to a busy mode of the telephone apparatus.

9. A portable telephone apparatus comprising:
an antenna for holding communication with a base station or a parent unit;

voice input means including a microphone;

voice output means including a speaker or a headphone;

operating means including keys and a display unit manipulated by a user operating the apparatus;

telephone control means for modulating a voice signal from the voice input means and outputting the modulated signal to the antenna and demodulating a radio signal received through the antenna, extracting and outputting the voice signal to the voice output means;

a chargeable battery for supplying power to the apparatus;

storage means for storing a compressed music data;

data restoration means for reading and expanding the data stored in the storage means, reproducing the data as a music signal and outputting the music signal to the voice output means; and

wire, radio or optical communication means for downloading the compressed music data to the storage means from an external source.

10. A portable telephone apparatus according to Claim 9,

wherein said communication means includes bidirectional communication.

11. A portable telephone apparatus comprising:
an antenna for holding communication with a base station or a parent unit;

voice input means including a microphone;

voice output means including a speaker and a headphone;

operating means including keys and a display unit manipulated by a user operating the apparatus;

telephone control means for modulating a voice signal from the voice input means and outputting the modulated signal to the antenna and demodulating a radio signal received through the antenna, extracting and outputting the voice signal to the voice output means;

a chargeable battery for supplying power to the apparatus;

storage means for storing a compressed music data; and

data restoration means for reading and expanding the data stored in the storage means, reproducing the data as a music signal, and outputting the music signal to said voice output means;

wherein said storage means is removable.

12. A portable telephone apparatus comprising:
an antenna for holding communication with a base station or a parent unit;

voice input means including a microphone;

voice output means including a speaker or a headphone;

operating means including keys and a display unit manipulated by a user operating the apparatus;

telephone control means for modulating a voice signal from the voice input means and outputting the modulated signal to the antenna and demodulating a radio signal received through the antenna, extracting and outputting the voice signal to the voice output means;

a chargeable battery for supplying power to the apparatus;

storage means for storing a compressed music data; and

data restoration means for reading and expanding the data stored in the storage means,

reproducing the data as a music signal, and outputting the music signal to said voice output means;

wherein data related to the telephone apparatus including an abbreviated dial and data including memo data produced by an operation of the operating means as well as the music data are read and written.

13. A portable telephone apparatus comprising:
an antenna for holding communication with a base station or a parent unit;

voice input means such as a microphone;

voice output means such as a speaker or a headphone;

operating means including keys and a display unit manipulated by a user operating the apparatus;

telephone control means for modulating a voice signal from the voice input means and outputting the modulated signal to the antenna and demodulating a radio signal received through the antenna, extracting and outputting the voice signal to the voice output means;

a chargeable battery for supplying power to the apparatus;

storage means for storing a compressed music data;

data restoration means for reading and expanding the data stored in the storage means,

reproducing the data as a music signal and outputting the music signal to the voice output means;

wherein not only a telephone voice and also music data contained in a radio wave arriving from the base station or the parent unit is demodulated by the telephone control means and stored in the storage means.

14. An audio apparatus comprising:

data compression means for compressing a music data into a format expandable by data restoration means through a conversion process corresponding to a recording scheme of at least one of a plurality of audio media including CD, MD and a cassette tape; and

communication means for downloading the compressed music data to a portable telephone apparatus having an interface with said communication means.

15. An audio apparatus comprising:

data compression means for compressing a music data into a format expandable by a data restoration means through a conversion process corresponding to a recording scheme of at least one of a plurality of audio media including CD, MD and a cassette tape;

removable storage means; and

means for writing the compressed music data into the removable storage means.

16. An audio apparatus comprising:

data compression means for compressing a music data into a format expandable by a data restoration means through a conversion process corresponding to a recording scheme of at least one of a plurality of audio media including CD, MD and a cassette tape; and

a power supply unit for charging a battery;

wherein the music data is downloaded while the battery is simultaneously charged.

ABSTRACT OF THE DISCLOSURE

A portable telephone apparatus usable both for telephone and hearing music is disclosed, including an antenna for holding communication with a base station or a parent unit, a voice input unit such as a microphone, a voice output unit such as a speaker, an operating unit including keys and a display unit manipulated by a user operating the apparatus, a telephone control unit for modulating a radio signal from the voice input unit and outputting the modulated signal to the antenna and demodulating the radio signal received through the antenna, extracting a voice signal and outputting the voice signal, a chargeable battery for supplying power to the apparatus, a storage unit for storing the compressed music data, a data restoration unit for reading, expanding and reproducing as a music signal the data stored in the storage unit, and a switching unit for selecting the voice signal demodulated by the telephone control unit or the music signal reproduced by the data restoration unit and outputting the selected signal to the voice output unit.

FIG. 1

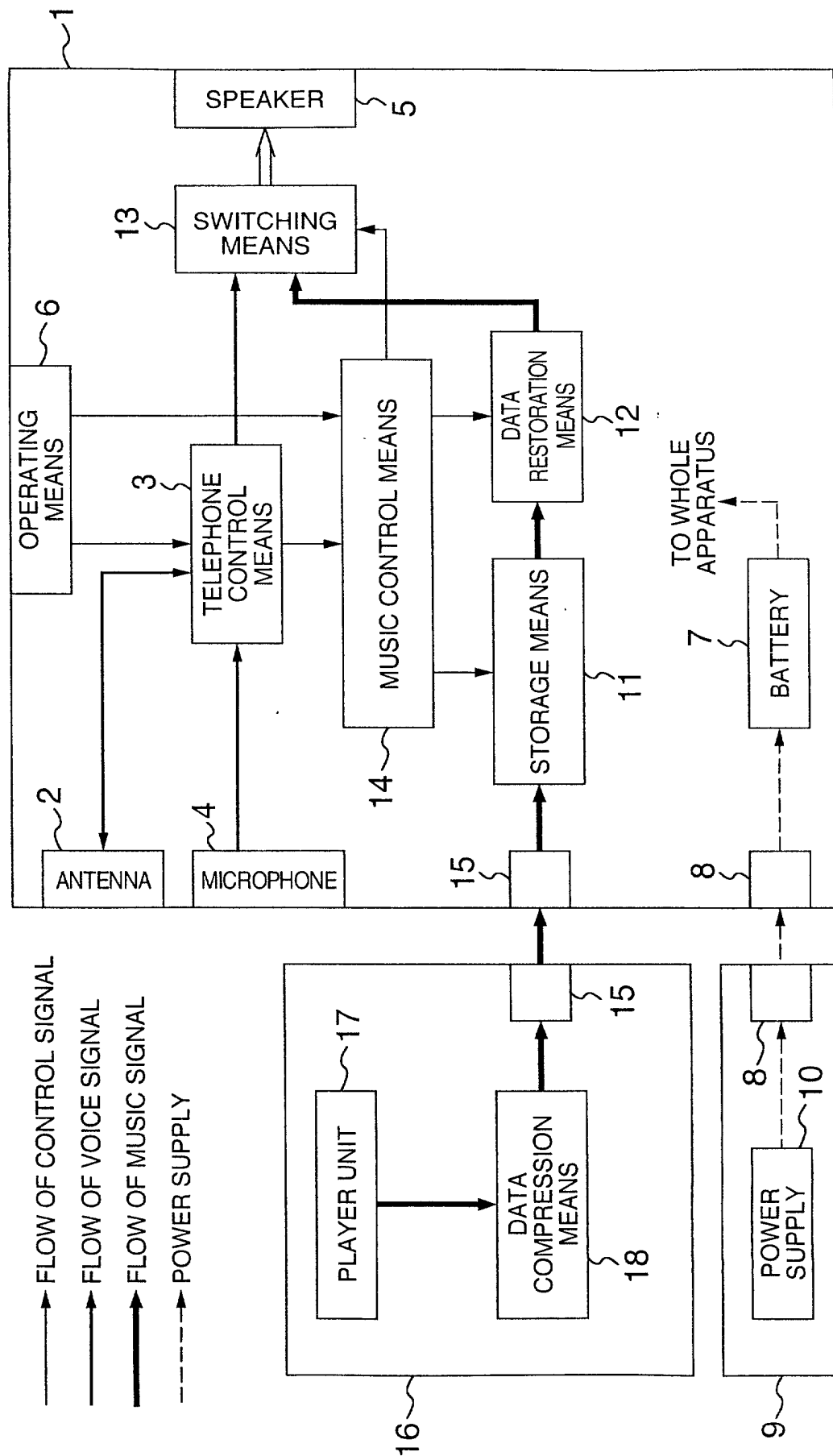


FIG. 2

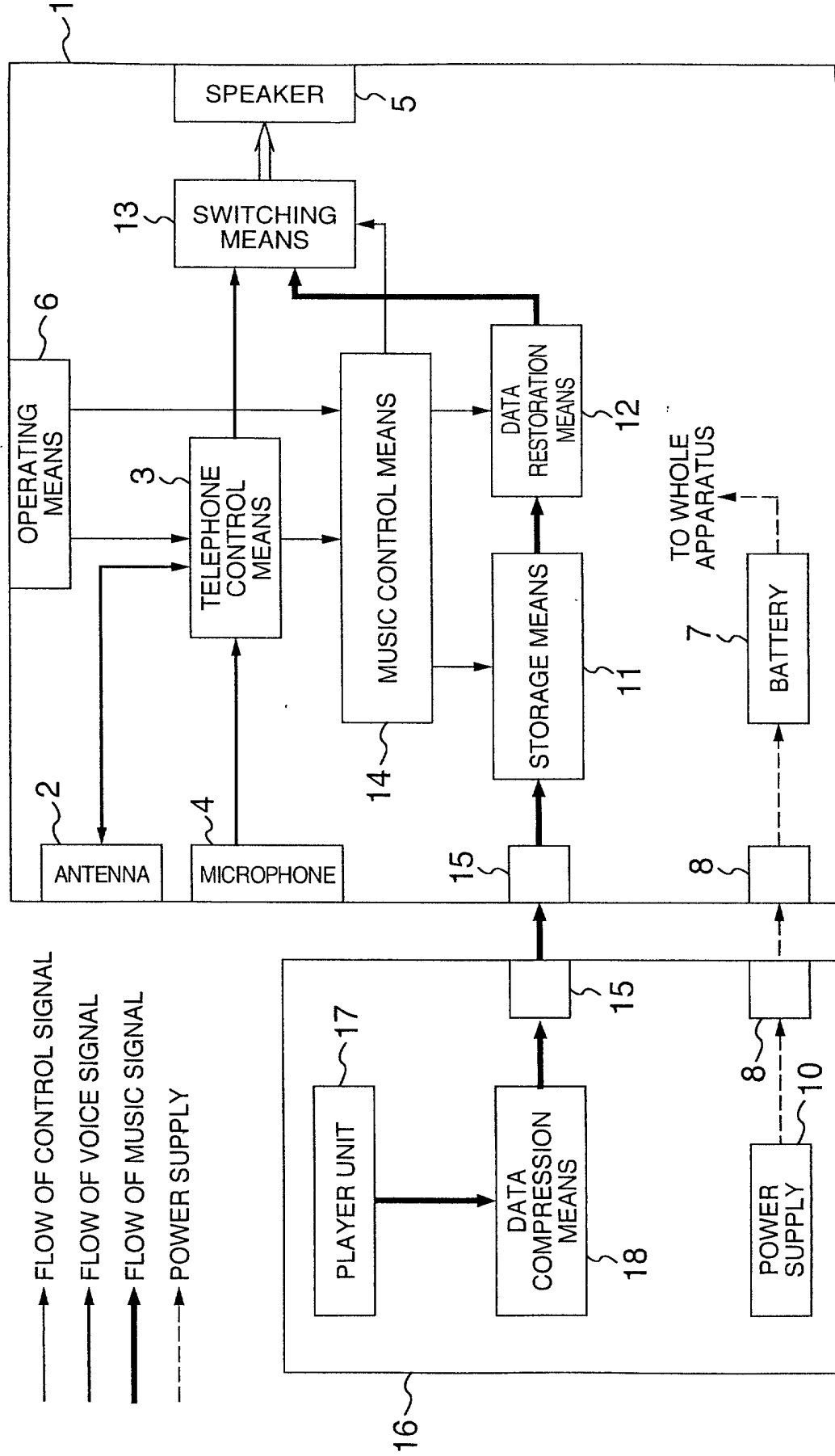


FIG. 3

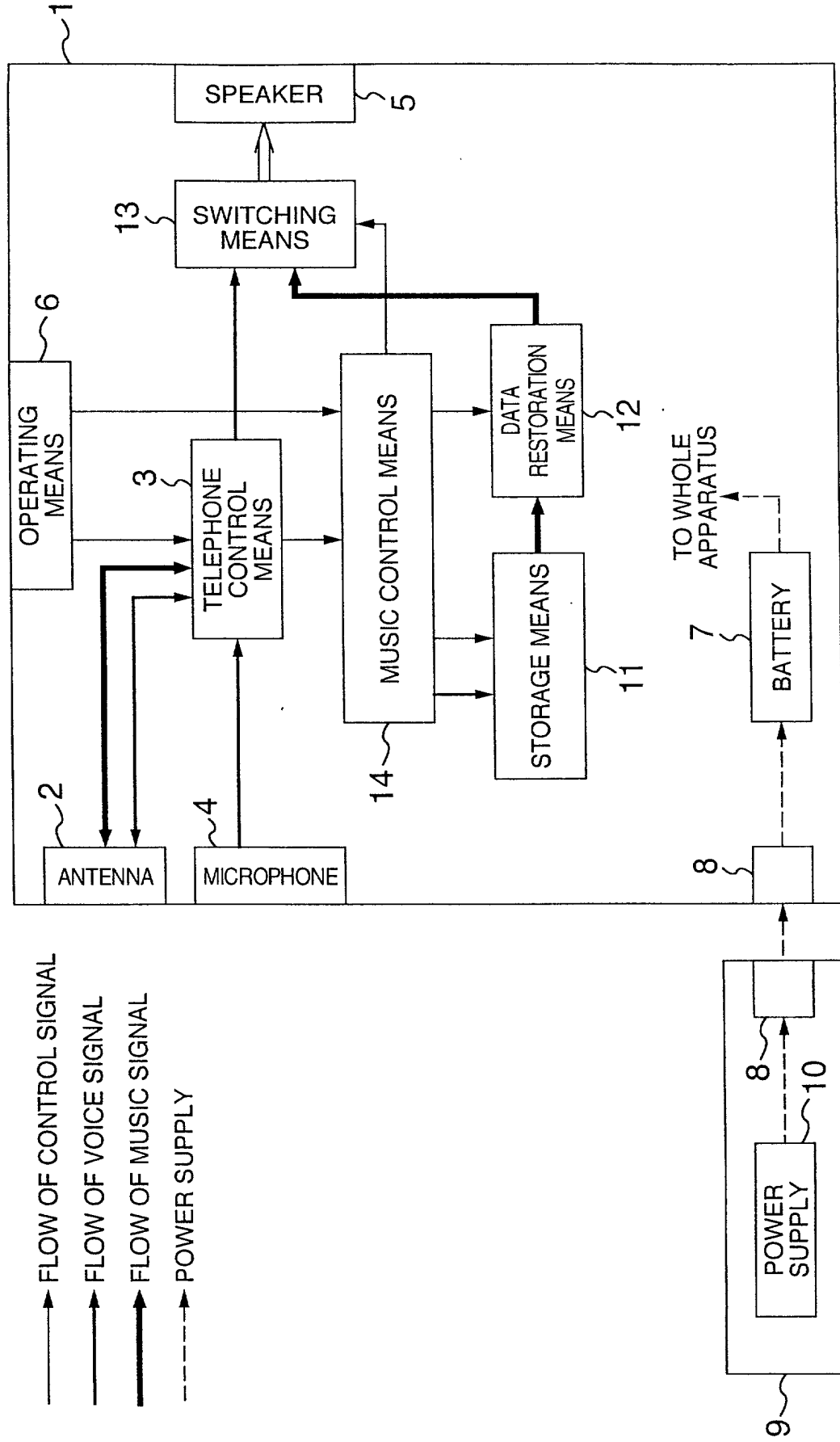


FIG. 4

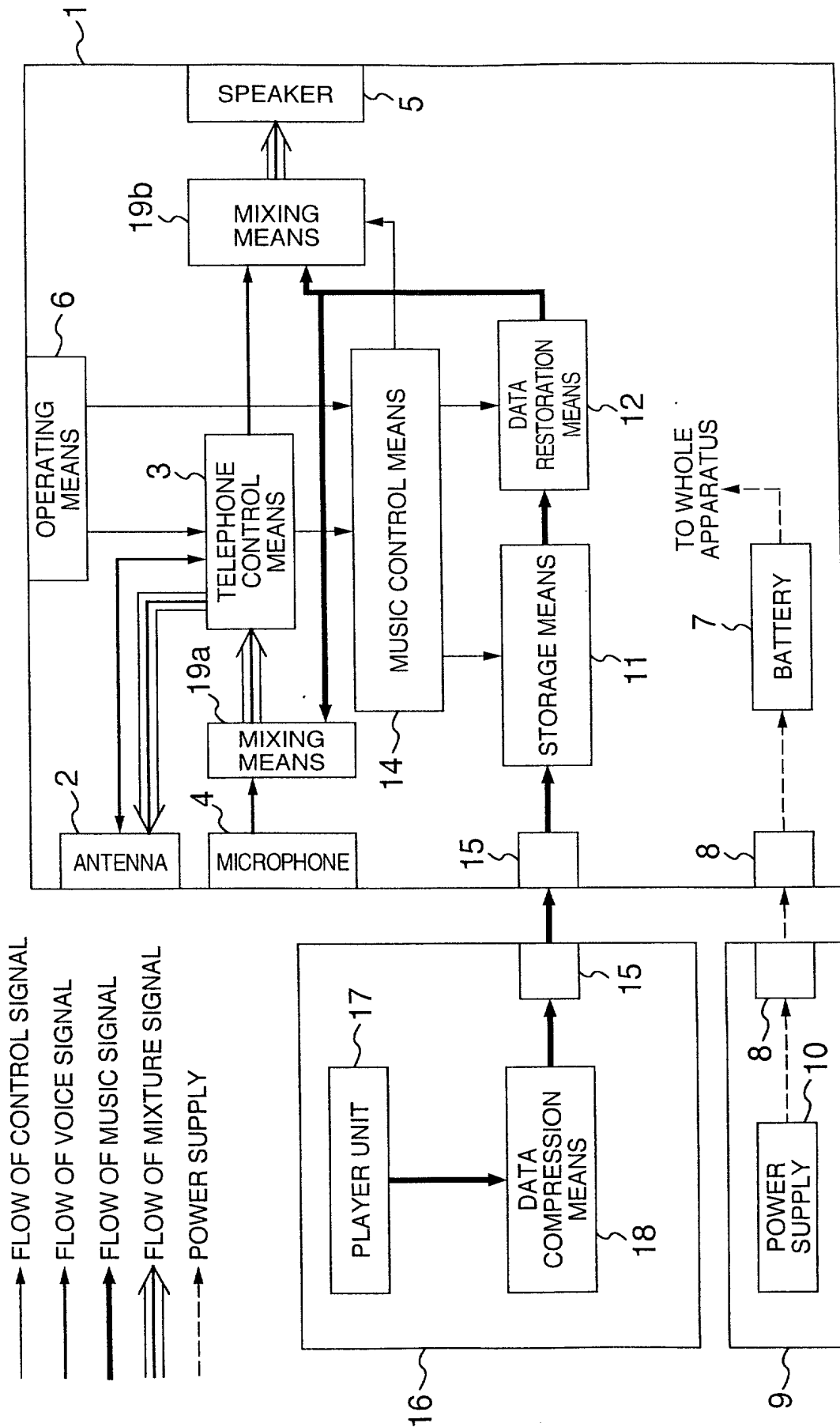


FIG. 5

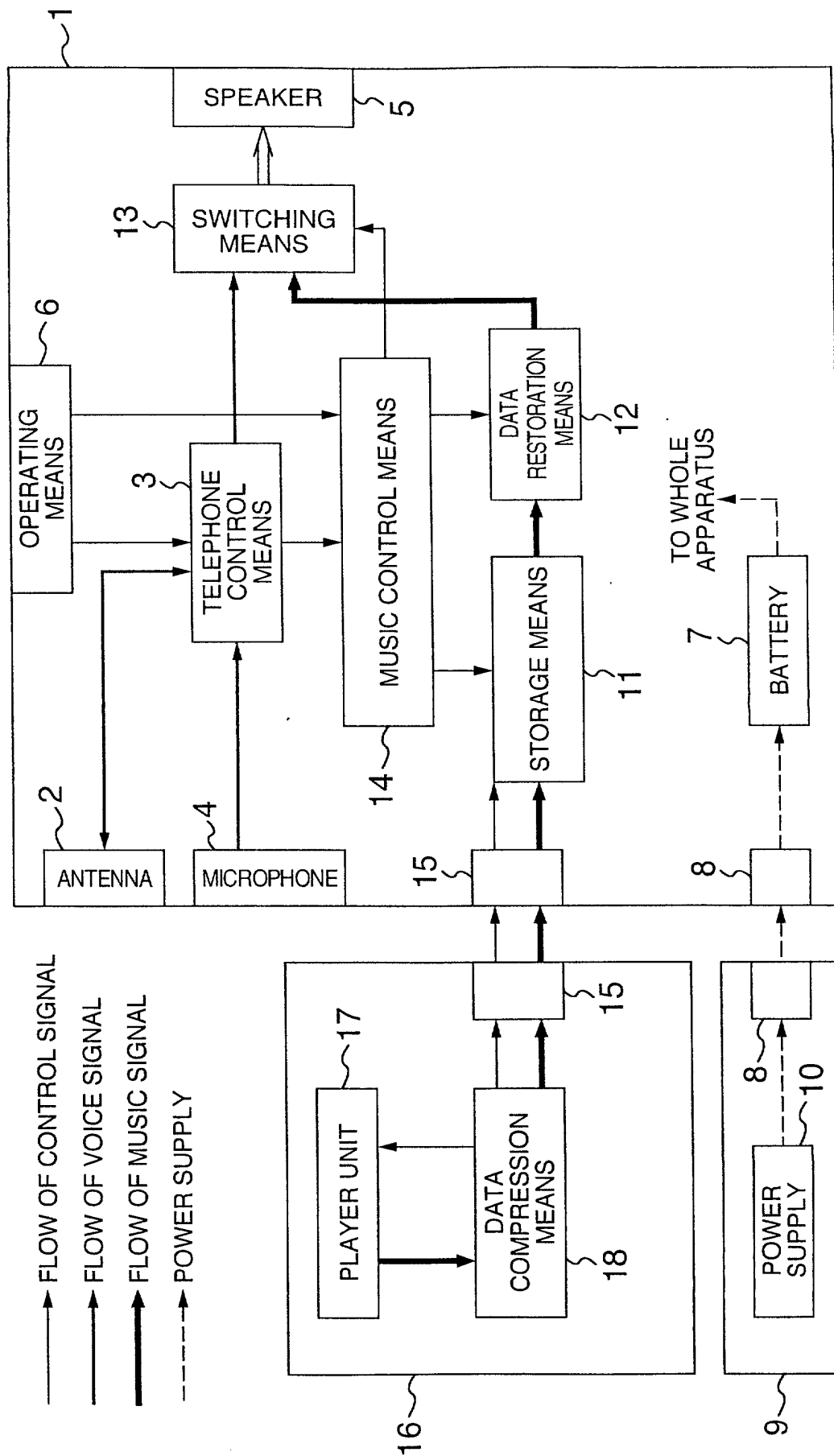


FIG. 6

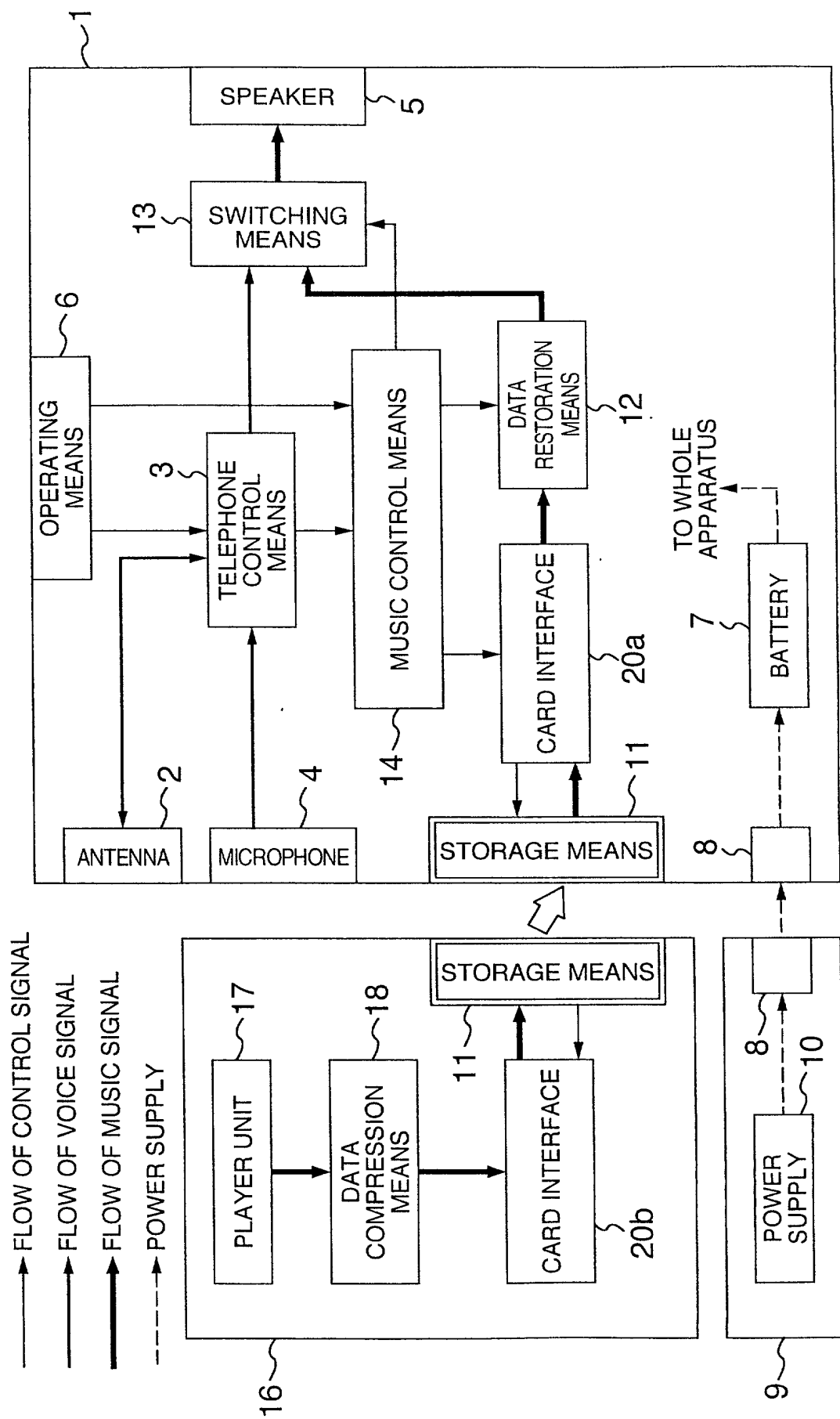


FIG. 7

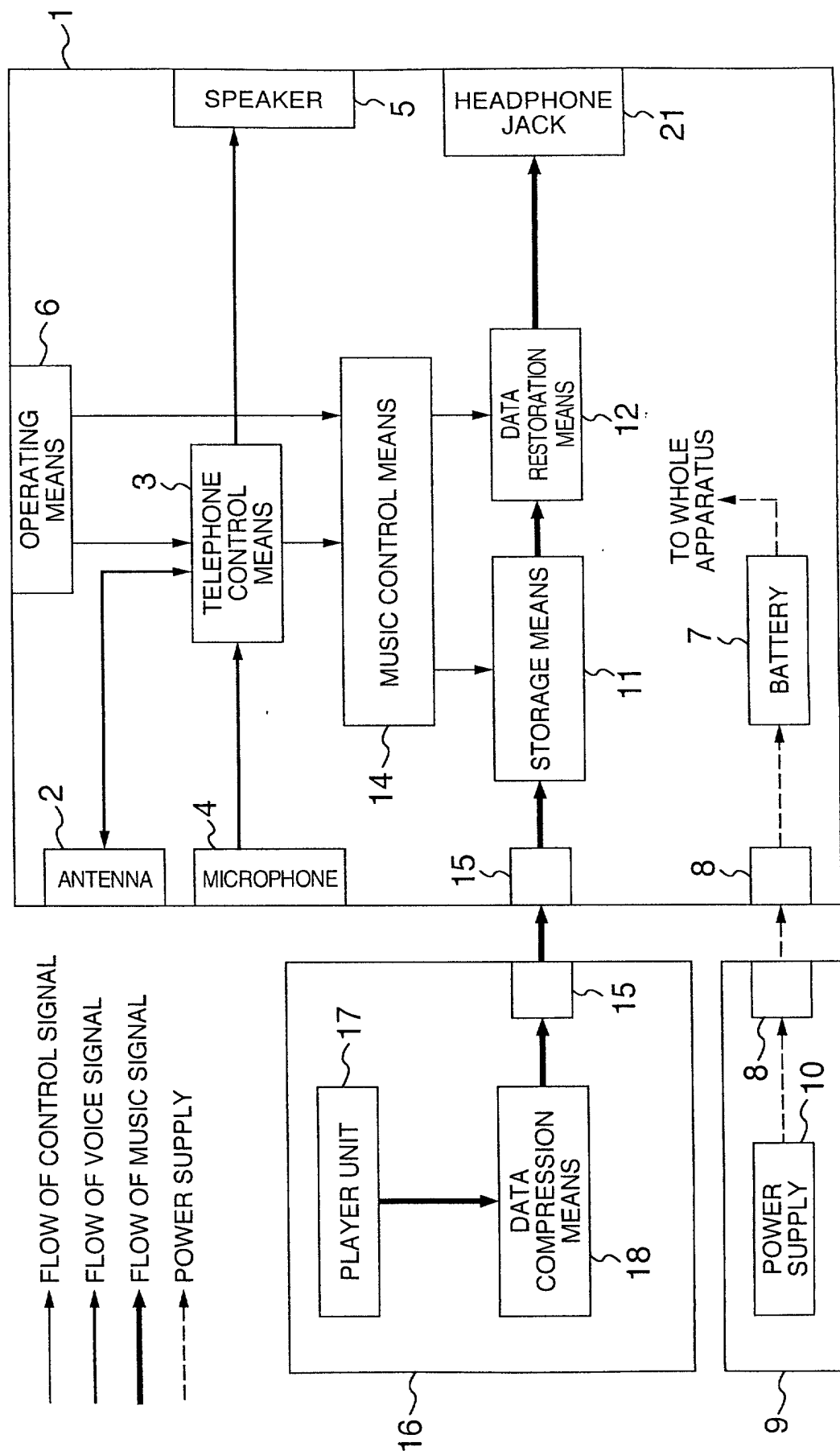
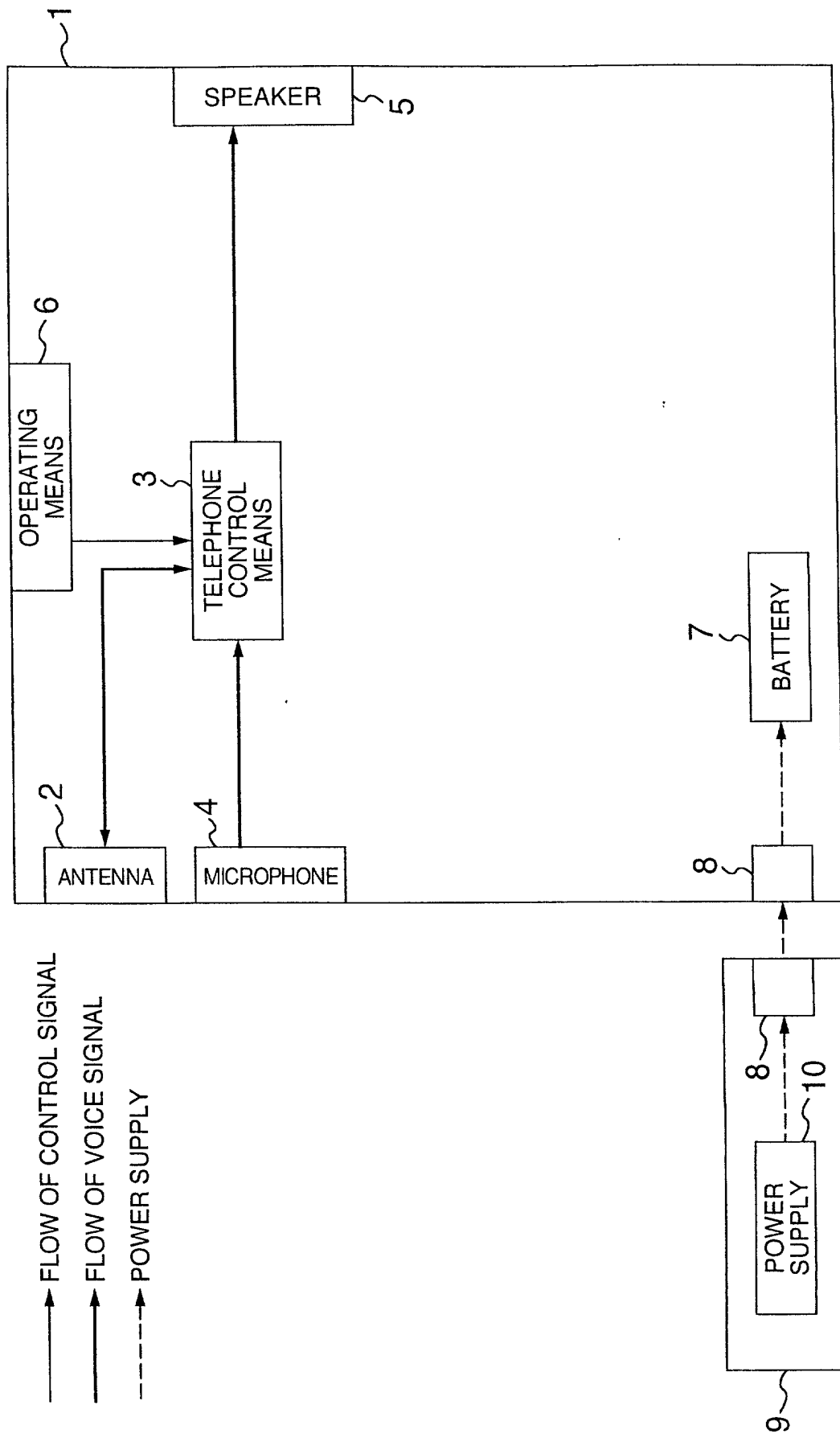


FIG. 8



APPLICATION FOR UNITED STATES PATENT **Declaration for Patent Application**

As a below named inventor, I hereby declare that:

My residence, post office address and citizenship are as stated below next to my name.

I believe I am the original, first and sole inventor (if only one name is listed below) or an original, first and joint inventor (if plural names are listed below) of the subject matter which is claimed and for which a patent is sought on the invention entitled: 1 "PORTABLE TELEPHONE APPARATUS AND AUDIO APPARATUS"
the specification of which 2 (file no. _____)

(check at least one)

3 ☒ is attached hereto

4 ☐ was filed on _____ as (5) U.S. Application Serial No. _____

6 ☐ and was amended on _____ (if applicable)

Use this portion only if you are entering the U.S. National phase based on a PCT International Application designating the U.S.

7 ☐ was filed as PCT international application
8 Number _____
9 on _____
10 and was amended under PCT Article(s) 19 and/or 34 _____ (if applicable).

I hereby declare that I have reviewed and understand the contents of the above-identified specification, including the claims, as amended, by any amendment referred to above.

I acknowledge the duty to disclose to the United States Patent and Trademark Office all information known to me which is material to patentability in accordance with Title 37, Code of Federal Regulations, §1.56.

I hereby claim foreign priority benefits under Title 35, United States Code, §119 or 365 of any foreign application (s) for patent or inventor's certificate listed below and have also identified below any foreign application(s) for patent or inventor's certificate or any PCT international application(s) designating at least one country other than the United States of America filed by me on the same subject matter having a filing date earlier than that of the application(s) on which priority is claimed.

Prior (Foreign) Application(s) any Priority Claims Under 35 U.S.C. 119 or 365

Priority Claimed

11a

<u>Japan</u>	<u>11-105175</u>	<u>13 April, 1999</u>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
(Country)	(Number)	(Day/Month/Year Filed)	Yes	No
<u> </u>	<u> </u>	<u> </u>	<input type="checkbox"/>	<input type="checkbox"/>
(Country)	(Number)	(Day/Month/Year Filed)	Yes	No
<u> </u>	<u> </u>	<u> </u>	<input type="checkbox"/>	<input type="checkbox"/>
(Country)	(Number)	(Day/Month/Year Filed)	Yes	No

☐ Additional foreign application numbers are listed on a supplemental priority data sheet attached hereto.

Priority Claim(s) from U.S. Provisional Application(s) - I hereby claim the benefit under Title 35, United States Code, §119(e) of any United States provisional application(s) listed below:

11b

<u> </u>	<u> </u>	<u> </u>	<u> </u>
Application No.	Day/Month/Year Filed	Application No.	Day/Month/Year Filed

☐ Additional provisional application numbers are listed on a supplemental priority data sheet attached hereto.

Do not use this portion to identify a PCT application if the parent application is the U.S. National phase of the PCT application

I hereby claim the benefit under Title 35, United States Code, 120 of any United States application(s) or under Title 35, United States Code, 365 of any PCT international application(s) designating the United States of America that is/are listed below and, insofar as the subject matter of each of the claims of this application is not disclosed in that/those prior application(s) in the manner provided by the first paragraph of Title 35, United States Code §112, I acknowledge the duty to disclose to the United States Patent and Trademark Office all information known to me to be material to patentability as defined in Title 37, Code of Federal Regulations, §1.56 which became available between filing date of the prior application and the national or PCT international filing date of this application.

12	<u> </u>	<u> </u>	<u> </u>
	(U.S. Parent Application or PCT Parent Number)	(Parent Filing Date)	Status (patented, pending, abandoned)

☐ Additional U.S. or PCT international application numbers are listed on a supplemental priority data sheet attached hereto.









I hereby appoint the following attorneys of the firm of Stevens, Davis, Miller & Mosher, L.L.P. as my attorneys of record with full power of substitution and revocation to prosecute this application and to transact all business in the Patent and Trademark Office:

James E. Ledbetter, Reg. No. 28732; Thomas P. Pavelko, Reg. No. 31689; and Anthony P. Venturino, Reg. No. 31674.

**ALL CORRESPONDENCE IN CONNECTION WITH THIS APPLICATION SHOULD BE SENT TO
STEVENSON, DAVIS, MILLER & MOSHER, L.L.P., 1615 L Street, N.W., Suite 850, Washington, D.C. 20036,**

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code, and that such willful statements may jeopardize the validity of the application or any patent issuing thereon.

PAGE 2 OF U.S.A. DECLARATION FORM

13a	Typewritten Full Name of Sole or First Inventor	Kenji SAKANASHI		
		Given Name	Middle Name	Family Name
14a	Inventor's Signature	 Kenji Sakanashi		
15a	Date of Signature	 March 30, 2000		
		Month	Day	Year
16a	Residence	Fukuoka-shi, Japan		
		City	State or Province	Country
17a	Citizenship	Japan		
18a	Post Office Address (Insert complete mailing address, including country)	6-29, Nagazumi-6-chome, Minami-ku, Fukuoka-shi, Japan.		
13b	Typewritten Full Name of Sole or Second Inventor			
		Given Name	Middle Name	Family Name
14b	Inventor's Signature			
15b	Date of Signature			
		Month	Day	Year
16b	Residence			
		City	State or Province	Country
17b	Citizenship			
18b	Post Office Address (Insert complete mailing address, including country)			
13c	Typewritten Full Name of Sole or Third Inventor			
		Given Name	Middle Name	Family Name
14c	Inventor's Signature			
15c	Date of Signature			
		Month	Day	Year
16c	Residence			
		City	State or Province	Country
17c	Citizenship			
18c	Post Office Address (Insert complete mailing address, including country)			
13d	Typewritten Full Name of Sole or Fourth Inventor			
		Given Name	Middle Name	Family Name
14d	Inventor's Signature			
15d	Date of Signature			
		Month	Day	Year
16d	Residence			
		City	State or Province	Country
17d	Citizenship			
18d	Post Office Address (Insert complete mailing address, including country)			

*Note to Inventor: Please sign name on line 15 exactly as it appears in line 14 and insert the actual date of signing on line 16. If there are more than four inventors, please add a copy of this page for identification and signatures for the additional inventors.